This report is part of a research project aiming to understand sanitation behaviors and the role of malodor in sanitation-related decisions in low-income urban settlements. This project was funded by the Bill & Melinda Gates Foundation and conducted by Firmenich and Archipel&Co.

Unless otherwise stated, all data derives from the field study conducted in selected settlements in China, India, Kenya and South Africa between September 2018 and July 2019. All data, analyses and subsequent conclusions are attributable to the information collected from the sample. For all local currency to United States Dollar (USD) conversion, the following average rates were used:

- China – USD 1: RMB 6.70
- India – USD 1: INR 71.70
- Kenya – USD 1: KES 101
- South Africa – USD 1: ZAR 14

Authors of the report

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Acknowledgments

Archipel&Co and Firmenich would like to acknowledge the invaluable support and contributions of their in-country partners and their local teams, without which this study would not have been possible.

China           India                Kenya              South Africa

Additionally, we would like to thank all the organizations met on the field for the purpose of the study (see page 8).

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EXECUTIVE SUMMARY

This research project aims to gain further insight into sanitation behaviors in low-income settlements and to identify factors that influence sanitation-related decisions – with a specific focus on malodor. The research was conducted in 10 locations across 4 countries: India, China, Kenya and South Africa.

This report highlights 7 key insights on sanitation in low-income settlements that go beyond the misconceptions that some might have and introduces recommendations going forward. More detailed data on each country is available in ancillary reports.

<table>
<thead>
<tr>
<th>MISCONCEPTION</th>
<th>INSIGHT</th>
<th>ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Poor people are not concerned about unsafe sanitation as they are used to living in unhygienic conditions.</td>
<td>#1 Sanitation is a key concern for those living in low-income settlements, especially women.</td>
<td>#1 Continue investing in sanitation to develop innovative and ambitious solutions. Involve people from communities as much as possible in the process.</td>
</tr>
<tr>
<td>#2 Providing access to infrastructure is the only way to tackle unsafe sanitation and improve the situation.</td>
<td>#2 A large number of people do not or cannot use existing public or private facilities. Unsafe sanitation practices are therefore significant even when toilets are accessible.</td>
<td>#2 User experience should be a key focus to make sure existing facilities are better used and customer centricity is a condition of success to ensure access to safe sanitation.</td>
</tr>
<tr>
<td>#3 In-house toilets are adapted to all and should be considered a priority by the authorities and the sanitation community.</td>
<td>#3 In-house toilets are not applicable in many houses given their layout and small size. Alternate options, such as community toilets or shared toilets are often more adapted to slum habitat realities.</td>
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</tr>
<tr>
<td>#4 Price is the main barrier to the adoption of safe sanitation practices. Making toilets free of charge would encourage people to use them.</td>
<td>#4 Price is not the main obstacle to the adoption of safe sanitation practices. But pricing strategies are essential to ensuring access to sanitation, sustainability and a sense of ownership.</td>
<td>#4 Explore successful and affordable community toilet paying schemes. Avoid models where construction of in-house or shared toilets are fully subsidized by the authorities.</td>
</tr>
<tr>
<td>#5 Improving user experience – odor and cleanliness - is considered a major driver for change if the most challenging availability problems (closing and waiting time) have been solved.</td>
<td>#5 Improving user experience has a significant impact on frequency of toilet usage and willingness to pay when awareness-raising programs are organized concurrently.</td>
<td>#5 Shift mindset from access to toilets to access to clean toilets. Develop solutions that address both malodor and cleanliness issues to ensure better user experience.</td>
</tr>
<tr>
<td>#6 Solving malodor issues in toilets will not influence sanitation behaviors, nor encourage people to use them more frequently.</td>
<td>#6 Improving user experience has a significant impact on frequency of toilet usage and willingness to pay when awareness-raising programs are organized concurrently.</td>
<td>#6 Invest in solutions to optimize the user experience in available toilets and launch inclusive community engagement programs. Availability (waiting and closing time) must otherwise be a priority.</td>
</tr>
<tr>
<td>#7 Caretakers of community toilets are insignificant players in the sanitation value chain and cannot contribute to changing sanitation behaviors.</td>
<td>#7 Caretakers could be critical changemakers in their community, and should be motivated, empowered and incentivized accordingly.</td>
<td>#7 Incentivize caretakers appropriately to keep them motivated and engaged. Recruit caretakers from local communities and ensure they develop strong connections with their community.</td>
</tr>
</tbody>
</table>
Successfully solving the sanitation challenge needs human-centric solutions.

The need for better sanitation in the developing world is clear. 40% of the world’s population - 2.5 billion people - still practice unsafe sanitation or lack access to adequate sanitation facilities. Associated challenges, in terms of public health and environmental protection, are huge and the international community has set itself an ambitious goal to improve the situation: Sustainable Development Goal #6.2 aims at achieving access to adequate and equitable sanitation and hygiene for all and end open defecation by 2030.¹

Until now, most of the efforts have been placed on improving sanitation infrastructure (the hardware): the sanitation community has primarily focused on finding innovative and tech-oriented solutions to improve access to equipment (e.g. container-based toilets, smart toilets, waste treatment solutions, etc.). Whilst these innovations are necessary, they tend to miss a critical issue: the complexity of human behaviors. A variety of sociological, economic and cultural factors influence daily sanitation decisions and must be considered to ensure existing infrastructure is used effectively. If not properly addressed, these factors can prevent people from using safe sanitation options, even when they are available, and make unsafe options such as open defecation preferable.

Consequently, the software issue - where infrastructure meets the end-user - is key and should also be addressed. Solving the sanitation issue will require putting the human dimension back at the center of the debate.

Understanding drivers that encourage (un)safe sanitation practices is key

In this context, understanding the factors that drive sanitation-related behaviors of low-income urban communities is critical. What are the different cultural, economic and sociological barriers and drivers that may influence people’s decisions when it comes to choosing where to urinate or defecate? The Gates foundation asked Firmenich and Archipel&Co to run 10 case studies in low-income settlements across 4 countries to gain further insights on this topic.

Focus was placed on the issue of malodor. Building upon the hypothesis that malodor makes toilets undesirable and might reduce toilet usage, the Gates foundation has partnered with Firmenich to develop a unique malodor counteractant technology. The technology aims to improve user experience and thus, contribute to Sustainable Development Goal #6.2 by encouraging people to adopt safer behaviors and move up the sanitation ladder, from open defecation to community toilets and eventually to individual toilets.

What is the specific role played by malodor among all the factors that influence sanitation decisions in low-income urban settlements? To what extent can the use of malodor counteractant technology encourage people to adopt safer sanitation practices and move up the sanitation ladder?

Sources: ¹ UN Sustainable Development Goals: 6 - Clean Water and Sanitation.
METHODOLOGY OF THE RESEARCH

10 case studies

Objectives:
(1) understand the sanitation ecosystem (policies, stakeholders, challenges), (2) assess the sanitation behaviors, needs and aspirations of low-income urban households and (3) analyze their usages and preferences related to odor and sanitation.

Methodology:
• 4 countries, 10 locations
• 5,600 respondents interviewed through the Community Voices© approach (see page 9)
• 250 interviewers recruited from local communities
• 60 stakeholders interviewed (public authorities, researchers, NGOs and sanipreneurs)
• 9 months (September 2018 - May 2019)

1 pilot test in Pune, India

Objective: assess the real impact of malodor counteractant technology on behavior change over a longer period of time and in real-life conditions.

Methodology:
• 1 city
• 8 settlements, 8 community toilets
• 6 months (January - June 2019)

Studies have been conducted in a few selected settlements of each city.

Criteria to select the settlements:
• Low-income settlements: have a high-level of informality, inhabitants face many socio-economic issues and lack access to essential services.
• Sanitation practices: various sanitation practices undertaken in the settlement, especially unimproved practices and open defecation.

As a result, figures are not representative of the cities but only capture the reality of the selected locations studied. Hence, in this report charts and figures refer to city names but only represent the realities of selected settlements.

CHINA

ANHUI PROVINCE

Date: March 2019
Sample: 403 households and 19 community toilet caretakers

SICHUAN PROVINCE

Date: April 2019
Sample: 413 households and 19 community toilet caretakers

INDIA

CHENNAI

Date: January 2019
Sample: 725 households and 58 community toilet caretakers
Settlements: Chithra, Pallavaram, Panangal, Maligai, Ramas and Thideer

DELHI

Date: March 2019
Sample: 529 households and 55 community toilet caretakers
Settlements: Ambedkarnagar, Ashik Vihar, Bhalaswa and Sultanpuri

MUMBAI

Date: November 2018
Sample: 531 households and 52 community toilet caretakers
Settlement: Mandala

PUNE

Date: September 2018
Sample: 604 households and 52 community toilet caretakers
Settlements: Bhim, Dias Plot, Ramtekdi and Yamuna

KENYA

KIBERA

Date: December 2018
Sample: 602 households and 55 community toilet caretakers
4 neighborhoods: Laini Saba, Lindi, Makina and Sarang’ombe

MATHARE

Date: January 2019
Sample: 671 households and 50 community toilet caretakers
10 neighborhoods: Kosovo, 2A, Gitathuru, Mabatini, Mashimoni, Number 10, 3A, 3B, 3C and 4B

SOUTH AFRICA

CAPE TOWN

Date: December 2018
Sample: 600 households and 39 community toilet caretakers
Settlements: Khayelitsha, Langa

JOHANNESBURG

Date: February 2019
Sample: 490 households respondents and 45 community and shared toilet caretakers
Settlement: Alexandra

Methods: the selection of locations

Studies have been conducted in selected low-income settlements in the cities mentioned on the map. The selected settlements are not necessarily representative of the cities/countries as a whole.
To better understand local sanitation contexts and ecosystems, Archipel&Co met many different stakeholders on the field. Firmenich and Archipel&Co would like to thank all of them for their time and contributions to the study.

China:
Non-Governmental Organizations: Research Center for Toilet Culture
Public authorities: Beijing Environmental Sanitation Outsourcing Company / Baizhi Village of Jiangyou, Mianyang / Environmental Sanitation Office of Hanshan County / Environmental Sanitation Office of Peicheng District, Mianyang / Ministry of Housing and Urban Rural Development of Quanjiao, Chuzhou / Urban Management and Law Enforcement of Nanqiao District, Chuzhou

India:
Non-Governmental Organizations and sanipreneurs: CHF India / CURE / Dham Foundation / ExNoRa International / FORCE / Information & Resource Centre for Deprived Urban Communities (IRCDC) / Mahila Milan / Pratha / Sanitation First / Sara Plast / Shelter Associates / Sparc / Sulabh / Swasti / Tiger Toilets / Toilet Coalition Board / Transparent Chennai (IFMR) / Water Aid
Academia: Centre for Policy Research / Indian Institute of Human Settlements / Samhita Social Ventures
Public authorities: Brihanmumbai Municipal Corporation (BMC) / Delhi Municipal Council (DMC) / Delhi Urban Slum Improvement Board (DUSIB) / Pune Municipal Council (PMC) / Sanitation Slum Program (SSP) / Tamil Nadu Slum Clearance Board

The 10 market research studies were conducted using Community Voices®, an innovative and inclusive market research approach co-developed by Firmenich, the Naandi Foundation (through the Mahindra Pride School program) and Archipel&Co. This innovative approach contributes to the collection of in-depth insights, while contributing to local economic development.

The approach consists of:
• Identifying and training young unemployed adults who are from targeted communities to design and administer questionnaires as to limit declarative bias and strengthen the authenticity of insights;
• Sharing the results with communities after the study to empower them, enable them to voice their concerns and make them part of the solution.

Two principles are utilized to collect reliable results:
• Mixing quantitative and qualitative phases: collecting qualitative testimonies before conducting quantitative surveys on a larger sample to cross-check insights and data.
• Engaging both foreign consultants and community interviewers: use of dual perspectives to cross-examine and enrich the analysis.

Three main positive outcomes:
• For companies and development organizations: a unique methodology to better understand low-income consumers and optimize product development.
• For the youth: an innovative approach that empowers young people by creating economic opportunities and building their capacities.
• For communities: an inclusive model that aims to voice people’s needs and aspirations and encourage them to take action for themselves.
SETTING THE SCENE: LOW-INCOME SETTLEMENTS

This research focused on low-income urban settlements in developing countries. Although there are a multitude of terms used when referring to these areas (slums, poor neighborhoods, informal areas, etc.), several commonalities can be observed: most of the time, they are rapidly growing areas with poor infrastructure and have residents who face massive social and economic challenges.

Four key characteristics were observed in all visited settlements:

1. Rapidly growing areas

Globally, rural-urban migration is increasing. 55% of the world’s population currently live in urban areas, and this share is expected to increase to 68% by 2050. Most of this increase will take place in Asia and Africa. This growing demand for urban space partnered with limited affordable housing has resulted in the development of large informal settlements in many cities.

2. “Slums of despair, slums of hope”

Two dynamics can be observed in informal settlements (sometimes within the same area):

- Some areas are improving and well-maintained with recent public investments (toilets, roads, water and electricity networks, etc.). In this situation, slums are seen as a gateway to escape poverty.
- Other areas are viewed as poverty traps. These slums are deteriorating and are often overlooked by public authorities resulting in dire living conditions for many households.

3. Strong heterogeneity of profiles among slum dwellers

Initial assessment is that slum dwellers are mostly poor individuals with relatively low education levels.

4. Areas with multiple layers of tension

Severe basic service shortages, deteriorating infrastructure and lack of resources have resulted in hostilities at multiple levels. Authorities’ resistance to providing formal infrastructure has angered residents, who often protest in retaliation. Additionally, people often get angry with each other (e.g. long queues to get access to toilets or to water taps). Lack of safety has become a daily concern for many in Kenya and South Africa. Even if solidarity and social bonds remain strong in some areas, safety concerns diminish trust amongst community members.

Sources:
1. The United Nations, Revision of World Urbanization Prospects, 2018
2. World Bank, Population living in slums (% of urban population), 2014
4. 55% of households interviewed live with less than USD 434 per month in China (the minimum wage).

An example of profile heterogeneity in Mathare, Kenya

1. The precarious

Households in extremely precarious situations
Will never be able to leave the slum

2. The vulnerable

Households who “hold on” but can fall back into precariousness at any time
Will be able to leave the slum, depending on opportunities

3. The emerging

Households who are starting to make it through and project themselves in the future

4. The established

Households who make a good living and are very respected in the community
Do not want to leave the slum, they enjoy a certain social status

Share of urban population living in low-income settlements in the 4 assessed countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>25%</td>
</tr>
<tr>
<td>India</td>
<td>24%</td>
</tr>
<tr>
<td>Kenya</td>
<td>25%</td>
</tr>
<tr>
<td>South Africa</td>
<td>23%</td>
</tr>
</tbody>
</table>

ZOOM: Low-income settlements in China

Unlike other assessed countries, China’s low-income settlements are rapidly disappearing due to substantial economic growth, policy reform and ambitious poverty alleviation strategies. Furthermore, general living conditions in China are better than in other assessed countries as more access has to higher revenues and better housing. Consequently, low-income areas visited in China were quite different from those observed elsewhere. Still, sanitation challenges remain.

Strong political will and associated policies have drastically reduced poverty in China.
There are many preconceived ideas and misconceptions associated with sanitation. The issue is complex and challenges are such that many have tried to solve the problem and may have an opinion on the topic. Reality on the field sometimes differs from these opinions and the situation is often more complicated. More detailed data on each country is available in ancillary reports.

7 KEY INSIGHTS

colleced on the field, that go beyond some misconceptions people might have regarding sanitation behaviors.

#1 Sanitation is a key concern for those living in low-income settlements, especially women.

#2 A significant number of people do not or cannot use existing public or private facilities. Unsafe sanitation practices are therefore significant even when toilets are accessible.

#3 In-house toilets are not applicable in many houses given their layout and small size. Alternate options, such as community toilets or shared toilets are often more adapted to slum habitat realities.

#4 Price is not the main obstacle to the adoption of safe sanitation practices. But pricing strategies are essential to ensuring access to sanitation, sustainability and a sense of ownership.

#5 Improving user experience - odor and cleanliness - is considered a major driver for change if the most challenging availability problems (closing and waiting time) have been solved.

#6 Improving user experience has a significant impact on frequency of toilet usage and willingness to pay when awareness-raising programs are organized concurrently.

#7 Caretakers could be critical changemakers in their community, and should be motivated, empowered and incentivized accordingly.
Sanitation is always spontaneously raised by respondents as a major issue in the low-income settlements targeted.

Sanitation is spontaneously raised as one of the major issues faced by respondents in the 10 assessed locations. It is the primary concern in South Africa and China, and in each of the four countries, more than one-third of respondents raise sanitation as one of the top issues in their settlement. Complaints include the inadequate type and number of toilets available as well as the bad user experience in existing facilities (lack of cleanliness, malodor, lack of safety, etc.).

Additional issues include concerns related to safety, lack of space, hygiene and water access, which are closely related to sanitation.

MISCONCEPTION: Poor people are not concerned about unsafe sanitation as they are used to living in unhygienic conditions.

KEY INSIGHT: #1 SANITATION IS A KEY CONCERN FOR THOSE LIVING IN LOW-INCOME SETTLEMENTS, ESPECIALLY WOMEN.

What are the main issues in your settlement?

<table>
<thead>
<tr>
<th>Issue</th>
<th>China</th>
<th>India</th>
<th>Kenya</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issues with toilets</td>
<td>33%</td>
<td>56%</td>
<td>54%</td>
<td>61%</td>
</tr>
<tr>
<td>Lack of space</td>
<td>30%</td>
<td>44%</td>
<td>54%</td>
<td>36%</td>
</tr>
<tr>
<td>Lack of hygiene</td>
<td>24%</td>
<td>43%</td>
<td>35%</td>
<td>31%</td>
</tr>
<tr>
<td>Lack of employment</td>
<td>23%</td>
<td>18%</td>
<td>33%</td>
<td>24%</td>
</tr>
<tr>
<td>Health access</td>
<td>20%</td>
<td>12%</td>
<td>30%</td>
<td>14%</td>
</tr>
<tr>
<td>Lack of safety</td>
<td>11%</td>
<td>12%</td>
<td>27%</td>
<td>14%</td>
</tr>
<tr>
<td>Water access</td>
<td>4%</td>
<td>54%</td>
<td>54%</td>
<td>36%</td>
</tr>
</tbody>
</table>

WATER ACCESS: Limited and irregular supply of water for drinking and other daily life activities, such as cooking and washing, are key concerns in India and Kenya (particularly during the dry season). Long queues for the collection of water and its transport are time and energy consuming. This issue directly impacts sanitation conditions as lack of water means dirtier toilets and limits cleansing post-defecation for washers such as in India.

HEALTH ACCESS: Health issues - many of which are related to water and sanitation conditions (diarrhea amongst children, urinary tract infections amongst women, etc.), the lack of affordable health facilities and treatment options are also often highlighted by slum dwellers as major issues.

LACK OF HYGIENE: Open drainage and waste management are problematic in all visited countries. City waste collection services do not serve all low-income settlements regularly resulting in the accumulation of waste and its associated drawbacks (pests, malodor, respiratory infections, etc.).

Sanitation is a major concern across all countries assessed: it is spontaneously raised by slum dwellers as a key issue that should be improved in priority.
Additionally, respondents of low-income settlements are aware of and concerned about the risks of unsafe sanitation practices, and often associate them with diseases.

More than half of community toilet users in India (51% of respondents) indicate that the unhygienic conditions in the community toilets have made them or their family members ill. In Kenya and South Africa, more than one inhabitant in five has fallen ill due to the bad conditions in community toilets. Although the mechanisms in which disease occurs are not necessarily well understood by households, it is a concern and people would like the situation to improve.

Share of respondents who declare that unhygienic conditions in community toilets have already made them or a family member ill

<table>
<thead>
<tr>
<th>Country</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Not assessed</td>
</tr>
<tr>
<td>India</td>
<td>24%</td>
</tr>
<tr>
<td>Kenya</td>
<td>20%</td>
</tr>
</tbody>
</table>

Furthermore, many acknowledge that the lack of hygiene in community toilets and unsafe practices increase the likelihood of infection. At least one quarter of respondents associate unsafe sanitation practices and bad community toilet conditions with the risk of catching diseases. This data shows that people are aware of and concerned about the risks of unhygienic sanitation. However, as we will see later, this is generally not sufficient to make them change their behavior.

Share of respondents who spontaneously associate unsafe practices or dirty community toilets with the risk of catching disease

<table>
<thead>
<tr>
<th>Country</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>24%</td>
</tr>
<tr>
<td>India</td>
<td>20%</td>
</tr>
<tr>
<td>Kenya</td>
<td>20%</td>
</tr>
</tbody>
</table>

Sanitation concerns are far higher amongst women.

When it comes to sanitation, women generally face greater challenges than men. In India, undertaking open defecation in outer lying areas with low light places women at risk of being raped or attacked. Coping strategies against this include open defecating in groups or shifting eating habits to limit bowel movements at night. In South Africa and Kenya, safety concerns around community and shared toilets drive women to remain indoors at night and utilize unimproved sanitation options, such as buckets, that they empty in open areas in the morning. Furthermore, in some cities, the lack of bins available for sanitary pads and the resistance by community toilets caretakers to remove such items exacerbate uncleanness and unhygienic conditions in community toilets.

Residents from low-income settlements often have multiple sanitation habits.

Many people have multiple sanitation practices and undertake sanitation decision arbitrage on a daily basis depending on the availability and conditions of facilities, as well as many other sociological factors. Consequently, position on the sanitation ladder is not definitive: people can move up or down from one step to another very easily, sometimes within the same day.

Practices vary considerably among inhabitants, even within the same household.

Sanitation-related decision processes are complex and individuals with similar profiles (type of house, revenue, etc.) do not necessarily have the same sanitation practices. Differential practices can also occur within the same household. Often the elderly and teenage girls prefer to use in-house toilets, whilst men and young children are more likely to have unsafe practices such as open defecation.

Significant leapfrogging can occur in the sanitation ladder with some skipping steps and moving directly to safer practices.

Five sanitation practices can be observed in most of the low-income settlements visited, and can be represented on a ladder. Ascending the ladder towards safe sanitation practices is not necessarily linear. People can move directly from one practice to another—for example, from unimproved sanitation in-house toilets. This movement depends upon many factors: education and awareness level, conditions of the existing sanitation options, willingness to pay to access an improved facility, etc.
Providing access to infrastructure is the only way to tackle unsafe sanitation and improve the situation.

MISCONCEPTION:

A LARGE NUMBER OF PEOPLE DO NOT OR CANNOT USE EXISTING PUBLIC OR PRIVATE FACILITIES. UNSAFE SANITATION PRACTICES ARE THEREFORE SIGNIFICANT EVEN WHEN TOILETS ARE ACCESSIBLE.

KEY INSIGHT:

The provision of sanitation infrastructure has been the priority of authorities when developing sanitation policies, however most do not address other key factors such as user experience.

CHINA

The Chinese government launched an ambitious "Toilet Revolution" program in 2015, that has massively contributed to improve the situation in the country. This program seeks to build and expand public & tourist toilets, promote the use of new technologies and develop a "civilized toilet culture". However, despite these improvements, challenges remain and unsafe sanitation practices still occur – especially among the elderly.

INDIA

Given the dire sanitation situation, the national initiative Swachh Bharat (Clean India) was launched in 2014. This nation-wide campaign aims to eliminate open defecation primarily through the construction of in-house toilets. Although the situation is progressively improving, many of these toilets remain unused today. Many observers denounce the lack of efforts devoted by authorities to awareness-raising and education campaigns to encourage people to adopt safer behaviors.

KENYA

The Kenyan government has a strong ambition to eradicate open defecation in the country. Both public authorities and sanipreneurs have brought innovative solutions to low-income settlements (including waterless container-based solutions). Kenya should inspire other countries as the right balance appears to have been found between providing improved infrastructure and encouraging people to actually use it through successful community-based management models.

SOUTH AFRICA

Sanitation is an extremely political topic in South Africa. National policy recognizes sanitation as a basic right and aims at providing free basic sanitation for the poor. However, municipalities are unable to meet growing demand and are increasingly relying on temporary sanitation solutions from outsourced companies (chemical toilets) not only resulting in anger and frustration amongst residents and civil society organizations but also ineffectively solving the sanitation problem.

POLICIES THAT CONSIST OF BUILDING INFRASTRUCTURE HAVE BEEN SUCCESSFUL TO ENSURE A BETTER ACCESS TO SANITATION BUT THEY MUST ADDRESS OTHER KEY OBSTACLES SUCH AS USER EXPERIENCE.
Unsafe sanitation practices still occur, despite the presence of safe infrastructure in all selected settlements.

Across all countries, many still practice unsafe sanitation even when they have access to safer options. This highlights that even when sanitation infrastructure does exist, people do not always choose the safest option. In India, more than half of residents open defecate (57% of respondents) despite settlements being equipped with community toilets and in-house toilets.

Most surprisingly, even when households are equipped with in-house toilets, up to one third of them prefer not to use their toilet (see Insight #4). In South Africa and Kenya, one in three residents use unimproved options, such as buckets, at night primarily due to safety concerns. In China, unsafe practices (use of chamber pots or outdoor latrines, where waste is traditionally used as fertilizer for nearby crops) are mostly undertaken by the elderly – even when safer options such as community toilets or individual in-house toilets exist.

A clear gap between sanitation options and real practices: In each location, a significant number of people occasionally or frequently do not use the safest sanitation option available to them, but are in fact moving down the sanitation ladder and undertaking unsafe practices.

Ensuring access to safe sanitation for all requires to address the various obstacles beyond the provision of infrastructure.

How to read the chart: In the settlements analyzed in South Africa, 54% of people whose only option is the community toilets do not actually use them all the time and are moving down the sanitation ladder, i.e. are using buckets occasionally or frequently. 10% of shared toilets owners do not use them and can also use buckets.

It is important to note that moving down the sanitation ladder leads to different practices in each settlement. In India, it will mainly mean that community toilet users will practice open defecation, while in South Africa or Kenya it will lead to using a bucket.

One of the key challenges for policy makers and the sanitation community is to go beyond accessibility and to address the other main obstacles.
In-house toilets are adapted to all and should be considered a priority by the authorities and the sanitation community.

MISCONCEPTION:

In-house toilets are not adapted to low-income settlement conditions and many people are not willing to invest in having one.

In the 10 locations assessed, about 40% of households that are not equipped with such equipment do not want to invest in one. When asked what would be the best way to improve the sanitation situation in their community, most spontaneously answer “improve existing community toilets.” Improvements include increasing the number of seats available, providing proper access to water and sewage networks and improving cleanliness and odor conditions.

Even when in-house toilets are available, up to one third of households prefer not to use them.

Even when households are equipped with an in-house toilet, they do not always use it. The same reasons are given: fear of blocked pipes, fear of malodor, willingness to save water and cultural issues (in India). These challenges highlight that in-house toilets are not always adapted to low-income specificities.
IN-HOUSE TOILETS ARE NOT ALWAYS ADAPTED TO SLUMS. ALTERNATE OPTIONS, SUCH AS COMMUNITY OR SHARED TOILETS MUST BE CONSIDERED

Alternate sanitation models that consist of sharing a toilet between a few households only, and who are responsible for its maintenance and cleanliness, are more adapted to settlement realities.

In Kenya, a container-based solution developed by Sanergy that addresses water shortages and affordability constraints, has rapidly won-over slum residents. In Johannesburg, over 40% of settlement residents would be willing to invest their personal funds into a shared toilet.

Shared toilets often offer a good user experience. The improved conditions are primarily due to users having a greater sense of ownership and accountability to fellow shared toilet users.

ZOOM – Sanergy and Fresh Life toilets: a game changer in Mathare, Nairobi.

Created in 2011 by Sanergy, Fresh Life is a container-based sanitation solution implemented in Mathare. Sanergy ensures the installation of the facility and the daily collection of the cartridge. The waste collected is converted into valuable end-product such as organic fertilizer for small-holder farmers in Kenya.

Fresh Life’s proposition is well adapted to slum realities:

- Waterless: dry toilets
- Safe: mostly built inside the plot area
- Affordable: fee paid on a monthly basis, cheaper than community toilets
- Easy-to-use: simple technology and training of community ambassadors to raise awareness among inhabitants

An aspirational solution with a positive impact on behavior change

Fresh Life toilets have rapidly won-over slum dwellers. They are very well perceived with close to two-thirds of community toilet users wanting access to Fresh Life toilets.

Safety, price and easiness to clean are among the top three drivers to build a Fresh Life plot toilet.

When people have access to Fresh Life toilets, they tend to give up on unsafe sanitation practices. When equipped, only 16% of them continue to open defecate or use a bucket (vs. 55% before).

Main drivers to build a Fresh Life plot toilets rather than continue to use community toilets

<table>
<thead>
<tr>
<th>Feature</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safer</td>
<td>67%</td>
</tr>
<tr>
<td>Cheaper</td>
<td>62%</td>
</tr>
<tr>
<td>Easier to clean</td>
<td>37%</td>
</tr>
<tr>
<td>Smells better</td>
<td>34%</td>
</tr>
</tbody>
</table>

Price is the main barrier to the adoption of safe sanitation practices. Making toilets free of charge would encourage people to use them.
Pricing strategies are essential

Price is often believed to be the key barrier to the adoption of safe sanitation practices in low-income settlements. However, even when toilet usage is free of charge, as in South Africa or some settlements in India, unsafe sanitation practices continue (almost in the same proportion as when people have to pay to use the toilets). Furthermore, making toilets free of charge can reduce the users’ sense of ownership and create counter-productive side effects (see below). Thus, price itself is not the main driver for unsafe practices.

Nevertheless, pricing strategies do matter considerably. The pay-per-use model can be an obstacle to the adoption of safe practices. For example, for a family of four living in Mandala (a low-income settlement in Mumbai, India), a monthly public toilet pass costs USD 0.6, while when paying per usage, a total of USD 6.7 is spent by the end of the month (with two usages of the toilet per day per person).

A relevant pricing strategy must, therefore, take into account three criteria: social impact, sustainability and sense of ownership.

Social impact: to achieve sanitation access for all, toilet usage prices should be as low as feasibly possible. Responses related to price, “because it is free / cheaper” were often mentioned by open defecators in the selected settlements of Mumbai and Pune to explain their practices. In-field experience highlights that the most vulnerable slum dwellers are more likely to adopt unsafe sanitation practices when a pay-per-use model is in place.

Sustainability: it is key to leveraging the pricing mechanism in public toilets to not only avoid open defecation but also to drive positive behavior change in a sustainable way. In public toilets, a pricing mechanism should create a virtuous cycle where users see and accept the value of the toilet facilities and subsequently have a higher willingness to pay to use the toilets, which in turn, contributes to maintaining and improving the toilets and their user experience. A monthly pass for a household, as is likely to increase adoption amongst family members (especially children) with no additional revenue for the toilet.

Sense of ownership: it is important that people pay for the cleaning and maintenance of shared toilets, to avoid the classic phenomenon of the “tragedy of the commons.” A monthly pass per adult users with a specific scheme for children (e.g. a monthly pass for all the children within a household) appears to be the best model as it articulates social impact (price is low) and has an appropriate economic incentive to enable a virtuous cycle.

Making toilets free of charge does not encourage the adoption of safe sanitation practices. On the contrary, it can have side effects that deter people from using facilities.

Example of China
The recent decision by Chinese authorities to make community toilets free of charge has had side effects: many mentioned that conditions were better when they paid. According to caretakers, users were more respectful, and in parallel, caretakers were more committed and effective when they had a financial interest to clean.

Example of Kenya
In Mathare, Kenya, some slum dwellers have collectively decided to invest in an “In-plot Fresh Life Toilet”. Each month, each household pays a fixed cost to Sanergy. The sense of ownership of the facility is high which leads to two main benefits: households actively maintain the toilet and unsafe sanitation practices tend to rapidly decrease.

PRICE IS NOT THE MAIN OBSTACLE TO THE ADOPTION OF SAFE SANITATION PRACTICES. BUT PRICING STRATEGIES CAN HAVE A POSITIVE IMPACT TO DRIVE BEHAVIOR CHANGE.
Malodor is a key issue spontaneously raised by respondents, no matter their sanitation practice. Malodor is raised as a key issue, that considerably affects users’ experience.

### ISSUES RAISED BY RESPONDENTS USING COMMUNITY TOILETS

Many people have a bad user experience in community toilets, especially in the locations targeted in South Africa and India.

#### Share of community toilet users that have a bad experience when using the facility

<table>
<thead>
<tr>
<th>Country</th>
<th>% of Users with a Bad Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>38%</td>
</tr>
<tr>
<td>India</td>
<td>57%</td>
</tr>
<tr>
<td>Kenya</td>
<td>25%</td>
</tr>
<tr>
<td>South Africa</td>
<td>81%</td>
</tr>
</tbody>
</table>

#### Main issues with community toilets

This bad experience is mostly due to the bad conditions of community toilets. Malodor and lack of cleanliness are consistently raised as the key issues with these facilities. Complaints include unclean toilet pits, blocked pipes and overfilled septic tanks.

#### ZOOM: Malodor, the last mile concern

Interestingly, malodor becomes the top issue in Kenya even though the general condition of the community toilets in Kibera and Mathare were much better than the community toilets visited in India, China or South Africa. Malodor seems to be a last-mile improvement and even more so when the overall user experience is already not so bad.

#### ZOOM: Waiting time in India

Increasing populations and the insufficient number of seats available in the analyzed settlements result in community toilets users having to queue for up to 45 minutes. Waiting time is also a source of tension in the community as many mentioned that people often fight whilst waiting in the queue. As a result, many respondents prefer to go directly to the closest open defecation area.

#### ZOOM: Safety at night in India, Kenya, and South Africa

Safety at night is a key concern and directly impact sanitation practices. Either caretakers refuse to work at night and close the community toilets (Kibera and Mathare), either the community toilets are open but people do not want to walk out of their house (South Africa and India). In such conditions, people often use a bucket inside their house at night.

#### ZOOM: These criticisms are understandable given the condition of community toilets

Conditions of community toilets vary substantially within a city and from one city to another, but a significant share of facilities are not in good condition. Across geographies, similar factors contribute to these bad conditions: overuse, ictivities, Lack of water and unmotivated and resource-limited caretakers. In contrast, innovative organizational models in Kenya and India (particularly in Delhi and Mumbai) that rely on active community engagement and educational campaigns have contributed to ensuring improved toilet conditions.

#### ISSUES RAISED BY RESPONDENTS PRACTICING OPEN DEFECATION

Across all studied locations, the bad condition of community toilets is one of the drivers to undertake open defecation rather than use existing facilities. Malodor and lack of cleanliness are often raised as the major issues with community toilets along with waiting time (particularly in India). In Kenya, another driver that encourages people to opt for open defecation or unsafe practices is the lack of an alternate option at night when community toilets are closed.

#### Main reasons why defecating in the open* is preferred to using community toilets

- **In India**, open defecation - as it is practiced in other countries - does not exist. In China, people using open pits were considered.

*In China, open defecation - as it is practiced in other countries - does not exist. In China, people using open pits were considered.*
ISSUES RAISED BY RESPONDENTS USING SHARED AND IN-HOUSE TOILETS

Across all locations, it was observed that some owners of shared or in-house toilets prefer not to use their equipment. Fear of malodor is one of the main reasons given: at least two thirds of shared toilet non-users and approximately 40% of in-house toilet non-users indicate “fear of malodor” as the key reason why they prefer not to use their toilet.

Additional barriers include the fear of blocked pipes and the lack of water, which arise from technical constraints and are associated with inadequate or badly constructed sewage and water connections. Improper connections result in pipe blockages and the inability to clean toilets and remove waste, which directly contributes to malodor.

MALODOR AND LACK OF CLEANLINESS ARE THE MAIN COMPONENTS OF THE USER EXPERIENCE AND SHOULD BE HENCE ADDRESSED IN PRIORITY.

Complementary to the 10 case studies, before/after tests were performed to show that malodor counteractant technology can contribute to shifting and improving sanitation behaviors.

Methodology of the test:

For these tests, the unique malodor counteractant technology co-developed by Firmenich and the Gates foundation was used.

This technology captures malodorous molecules and in turn releases a pleasant fragrance. To work, the technology should be incorporated into a product (e.g. cleaning liquid product, air freshener pad, etc.).

For the in-field tests air freshener pads with a jasmine fragrance, that was fine-tuned in close collaboration with Firmenich R&D teams, was used.

Two different pads were used for the tests: high dosage pads for community toilets and low dosage pads for in-house and shared toilets. When installed in appropriate conditions (good ventilation, no humidity, average temperatures, etc.), the pads can last up to two weeks.

The objective of the test was to answer the following question:

To what extent can the use of malodor counteractant products encourage people to adopt safer sanitation behaviors and move up the sanitation ladder?

Details of the two tests performed in each location:

Two tests were performed based on the toilet type: one test addressed community toilets users & open defecators, whilst the second addressed in-house toilets owners. Each test was performed in 3 steps: (1) pre-intervention interview (2) intervention and (3) post-intervention interview.

<table>
<thead>
<tr>
<th>TARGET</th>
<th>PRE-INTERVENTION</th>
<th>INTERVENTION</th>
<th>POST-INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>People without access to private facility (community toilet users and open defecators)</td>
<td>In-house interview Understanding sanitation practices and perception of community toilets</td>
<td>Cleaning &amp; installation of pads in community toilets: Professional cleaning &amp; installation of 12-15 pads in each facility for 12 hours prior to follow up interview</td>
</tr>
<tr>
<td></td>
<td>Visit of the treated toilet and interview Perception of toilets &amp; potential impact on behavior change assessed for each target Open defecators: Willingness to use community toilets in such conditions Existing users: Willingness to pay more to access toilets in such conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test 2</td>
<td>People with access to private facility (in-house toilet owners)</td>
<td>In-house interview Understanding sanitation practices and perception of in-house toilets</td>
<td>Installation of pads in in-house toilets Single pad installed for 24 hours, households were asked to use their in-house toilet over this period</td>
</tr>
<tr>
<td></td>
<td>In-toilet interview Perception of toilet odor &amp; potential impact on behavior change assessed for each target Users: Willingness to buy such product for their toilet Non-users: Willingness to start using their toilet more often</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
KEY RESULTS OF THE TESTS (DECLARATIVE ANSWERS):

An overwhelming majority of respondents perceived the treatment to be effective: around 90% consider the situation ‘much better than usual’ and declared a willingness to pay or to pay more to access facilities in such conditions.

Addressing malodor can encourage those with unsafe sanitation practices to move up the sanitation ladder and start using community toilets.

Most of community toilets users are willing to pay to access community toilet in improved conditions.

Different paying schemes lead to different willingness to pay.

Malodor counteractant technology has also the potential to encourage in-house or shared toilet non-users to begin using their toilets.

A specific test conducted in Kibera and Mathare (Kenya) emphasized that for malodor treatment to be fully effective, it should be combined with cleanliness treatment.

When asked to describe how one knows whether a community toilet is clean, the first answers are consistently related to smell (“there is no malodor,” “it has a nice fragrance,” “it smells like cleaning products”). Hence, our intuition was that products that bring a solution to both cleanliness and malodor issues are most valued.

To demonstrate this, the role of cleaning was isolated from that of smell. This was to assess the impact each would have on the perception of toilets and the potential behavior change amongst community toilet users. The test was performed in Nairobi, given that the conditions of community toilets in Mathare and Kibera (two biggest slums of the city) were similar. Two different treatments were implemented:

- In Kibera, community toilets underwent standard treatment (cleaning and installation of pads)
- In Mathare, no cleaning was conducted and only the installation of pads occurred.

USER EXPERIENCE IS CONSIDERED A MAJOR DRIVER FOR CHANGE ONLY WHEN AVAILABILITY ISSUES HAVE BEEN SOLVED

The tests have demonstrated improving user experience can have two main effects:

- Reduce open defecation and shift the behaviors of current open defecators to begin using existing toilets.
- Improve the willingness to pay for improved conditions amongst existing toilet users.

Nevertheless, these effects will vary according to the local situation and the other challenges the communities may experience. The effect of improving malodor in the 10 assessed settlements can be divided into three groups:

Limited effect - in settlements where availability issues such as closing and waiting times are not solved.

- In settlements, such as in Mumbai, which have acute difficulties in toilet availability, and hence a relatively high prevalence of unsafe practices, improving the user experience will likely have a limited effect if waiting time and other access concerns are not addressed (which implies the need to build additional toilets - new facilities or additional stalls within existing facilities). Only 12% of the respondents in Mumbai have declared that a malodor treatment will likely contribute to changing their sanitation behaviors (it is the lowest rate of the 10 case studies). In South Africa the lack of safety is a major concern and accounts for movement down the sanitation ladder at night and thus improving user experience in public toilets will not have an effect on changing these behaviors.
Shifting from access to toilets to access to clean toilets is required to meet the sanitation challenge. Improving user experience is key and both odor and cleanliness must be addressed.

Considerable effect – in settlements where unsafe practices are common and issues with user-experience are significant.

This cluster occurs in settlements, such as in Delhi, Chennai or Pune, where a substantial number of people have unsafe practices and the difficulties associated with toilets are relatively moderate (such as malodor, cleanliness, general maintenance concerns etc.). Improving the user experience in these community toilets could have a considerable effect on both reducing unsafe sanitation practices (i.e. open defecators will use community toilets) and increasing the willingness of existing users to pay (between 35 to 45% of the respondents in these cities indicate they would be willing to pay for improved conditions).

Limited effect - a last-mile solution to be 'open defecation-free' but a considerable impact to social cohesion within settlements where toilets are in rather good condition.

The last cluster of settlements have toilets that are in relatively good condition and subsequently have a relatively low occurrence of unsafe practices. The toilets are effectively managed by community-based organizations (as in Kenya) and are used by most of the community. Treating the odor issue in these toilets will have a limited effect on the reduction of unsafe practices as those with who have such practices do so due to specific availability challenges (security and closed at night). However, the malodor treatment is appreciated by existing toilet users and most declared an increased willingness to pay if toilets were in improved conditions.

The real effect is on social cohesion: “As a community health volunteer, I think providing people with clean and good smelling toilets is important for users but also for the community itself. Improving user experience will reduce tensions and frustrations while improving the social welfare of the community.”

MISCONCEPTION:

Solving malodor issues in toilets will not influence sanitation behaviors, nor encourage people to use them more frequently

KEY INSIGHT:

#6

Improving user experience has a significant impact on frequency of toilet usage and willingness to pay when awareness-raising programs are organized concurrently.
A pilot was run in Pune (India) to assess the potential behavior change in real-life conditions. In order to fully assess the potential impact of the malodor counteractant technology on behavior change, a pilot test was conducted in Pune over a 6 month period. As results from market research studies may include a declarative bias, the pilot test aimed to bypass any such bias and assess users’ perceptions and potential for behavior change in real-life conditions: if community toilets receive malodor counteractant technology and cleanliness treatment, what impact could this have on users’ behaviors?

**OBJECTIVE OF THE PILOT TEST:**

The objective of the pilot test was twofold:
- Assess users’ perception of the product over a long period of time: to what extent can it change their experience?
- Identify the conditions under which the technology can have a real impact on behavior change: to what extent can the use of malodor counteractant products increase the number of people attending community toilets and convince people with unsafe practices (namely, open defecation) to start using them?

**METHODOLOGY:**

The test was performed in 8 community toilets, managed by Pune Municipal Corporation, with similar characteristics and comparable initial conditions. The test assessed and compared the attendance in community toilets, before and after different treatments (including the use of RB products containing the malodor counteractant technology), to quantify the impact of these interventions on behavior change. Scanner devices recorded toilet attendance. Additional surveys were organized regularly to collect further insight (profile of users shifting practices, etc.).

3 intervention periods:
1. **Pre-intervention** (6 weeks): no treatment as to capture the regular attendance in the 8 community toilets (control period)
2. **Cleaning** (6 weeks): cleaning and odor treatments
3. **Cleaning + community engagement** (8 weeks): cleaning and odor treatments + community engagement activities (awareness-raising campaigns, community events, etc.)

4 treatments (2 toilets for each treatment):

- **A** No intervention (control group)
- **B** Cleaning with a local cleaning product
- **C** Cleaning with RB product with malodor counteractant technology
- **D** Cleaning with RB product with malodor counteractant technology and air freshener pads

**Results and main learnings of the pilot test:**

**LEARNING 1**

Improving the conditions in community toilets is highly valued by people and can lead to behavior change.

- **Satisfaction levels on general cleanliness and smell have more than doubled during the pilot test in all treated community toilets.**

 shares of users of community toilets treated with RB cleaning product and Firmenich pads (treatment D) who appreciate the condition of their toilet

<table>
<thead>
<tr>
<th>Period</th>
<th>Cleanliness</th>
<th>Smell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period 1</td>
<td>42%</td>
<td>87%</td>
</tr>
<tr>
<td>(pre-intervention: no specific cleaning treatment)</td>
<td>111% increase</td>
<td>111% increase</td>
</tr>
<tr>
<td>Period 2 &amp; 3</td>
<td>38%</td>
<td>89%</td>
</tr>
<tr>
<td>(cleaning and odor treatment)</td>
<td>131% increase</td>
<td>131% increase</td>
</tr>
</tbody>
</table>

How to read the chart: During pre-intervention phase (period 1), 38% of treatment D toilet users thought the smell in their toilet was good or very good. After treatment started, this figure increased to 87% - which represents an increase by 131%.

x 2.3 increase in the number of users who are satisfied by the cleanliness and smell of their community toilets due to the intervention

**I live right next to the community toilets. A few months ago, the bad smell was entering my house every day. Now the bad smell is controlled, and sometimes a pleasant smell comes from the building. It’s nice.**

Joshi, 32 years old, Yamuna Nagar, Pune

Community toilet users indicated that they were satisfied with the cleanliness and smell following the intervention.

During the pilot, Archipel&Co worked in close collaboration with designated caretakers of the 8 community toilets and provided them with new equipment, cleaning training, social and financial incentives. Building a close and trustful relationship with caretakers was identified as a key condition of success of this pilot test.
This improvement of user experience has led to a traffic increase.

In the best-case scenario (treatment with RB cleaning product + Firmenich pads, on the male side which is usually in a worse initial condition), the number of people attending the facility increased by 16% between period 1 and period 3. Concurrently, traffic in the control group toilets stagnated or slightly increased (1% increase). This confirms that behavior change can happen: if conditions of community toilets are improved, people are willing to start using them or use them more often.

Percentage of traffic increase in control group toilets versus toilets treated with RB cleaning product + Firmenich pads (treatment D).*

<table>
<thead>
<tr>
<th>Period</th>
<th>Percentage Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>2%</td>
</tr>
<tr>
<td>RB cleaning</td>
<td>1%</td>
</tr>
<tr>
<td>RB cleaning</td>
<td>2%</td>
</tr>
<tr>
<td>Firmenich pads</td>
<td>16%</td>
</tr>
</tbody>
</table>

Remark: B and C treatment toilets suffered from unexpected events, affecting the reliability of results (water shortage, troubles in communities, unreliability of caretakers). Due to these biases, all results presented here compare treatment D toilets with the control group to ensure consistency and reliability.

Interviewers from the local community further explored the increase in community toilet traffic to identify which individuals had changed their sanitation behaviors.

This increase in traffic can partly be attributed to open defecators who have shifted behaviors.

Qualitative and quantitative surveys run before and after the intervention confirmed that most of the new users of community toilets were previously open defecators who had started using the community toilets during the pilot test. Additionally, traffic in the male side of community toilets increased to a greater extent than in the female side (16% vs 6%) – this is a positive sign, as most of the time open defecators are men who are deterred by the bad conditions of community toilets (male sides are always dirtier than female sides). Thus, it shows that providing clean and pleasant-smelling toilets may have more of an impact on males than on females and can contribute to changing sanitation habits.

Behavior change requires long term community engagement.

These positive results were only possible because the pilot was run over an extended period of time. Indeed, behavior change requires time, especially when it comes to intimate and personal habits such as sanitation. Additionally, gaining the trust of the community requires time and the development of personal connections. During the first few weeks of the intervention period many questions were raised by inhabitants. Informing and reassuring slum dwellers was then the first task to undertake. After a few weeks, behavior change started to take place.

Over the 14 week intervention, a 16% increase in traffic was the maximum achieved (in some community toilets only). Over the longer term, behavior change often follows an exponential curve: as word of mouth increases, it encourages people to imitate what their neighbors do.

Behavior change requires time, especially when it concerns such a sensitive topic.

How to read the chart: Before we started to intervene, the community toilet registered an average of 1,264 entries per day (nb: if a person uses the toilet twice a day, it represents 2 entries). In period 2, when we cleaned and put air freshener pads, it went to 1,290 entries per day (+2% increase). In period 3, when we added the community engagement activities, the number of entries increased much more rapidly, to reach 1,472 entries per day (+16% compared to period 1).

Behavior change takes time, especially when it concerns such a sensitive topic.

Behavior change strategies should not only target individuals but must address a wider audience through community engagement.

The positive results obtained during this pilot test were possible because of active community engagement campaigns. During period 2, traffic in community toilets started to increase, albeit very modestly (+2%). The real change occurred in period 3 when several actions were launched to engage communities and raise visibility of the intervention. After these engagements, traffic increased almost immediately at a much faster pace (+16%) emphasizing the absolute necessity of actively engaging communities during the process to ensure behavior change can happen.

Number of people attending the community toilets which were treated with RB cleaning product and Firmenich pads (treatment D), on a daily basis

<table>
<thead>
<tr>
<th>Period</th>
<th>Number of People Attending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-intervention</td>
<td>1,264</td>
</tr>
<tr>
<td>Period 1</td>
<td>+2%</td>
</tr>
<tr>
<td>Period 2</td>
<td>1,290</td>
</tr>
<tr>
<td>Period 3</td>
<td>+16%</td>
</tr>
<tr>
<td></td>
<td>1,472</td>
</tr>
</tbody>
</table>

Increase in attendance rate is much higher when community engagement actions are conducted.

Poster campaign in Pune alerting the community that an intervention had taken place in their community toilet, “Something happened in your community toilet, come and have a look.”

Poster campaign in Pune alerting the community that an intervention had taken place in their community toilet, “Something happened in your community toilet, come and have a look.”
In order to verify these positive results and confirm the behavior change curve, it would be interesting to pursue such tests over a longer period of time, and:

• Engage organizations in charge of community toilets (to pay for and supply the product to the toilets)
• Train and incentivize caretakers to encourage them to use the product and keep the facilities clean
• Organize community engagement actions and awareness-raising campaigns to educate people

Different actions were undertaken:

• Awareness-raising campaigns: posters were displayed in communities and SMS campaigns promoted easy-to-remind slogans promoting safe sanitation
• Community events: one event was organized in each community to explain the project, promote caretakers’ efforts and gather everyone for debates, games and dinner
• Mobilization of local influencers: local influencers (within communities) were involved to benefit from their influence over their peers
• Creation of a network of ambassadors: a network of dynamic community toilet users was created with the aim of spreading the word in the community and convince open defecators to change their behavior

Although these efforts turned out to be effective, one should remember that they are resource-heavy and time-consuming. They require strong community connections and the development of mutual trust over the long term.

WHAT’S NEXT?

In order to verify these positive results and confirm the behavior change curve, it would be interesting to pursue such tests over a longer period of time, and:

• Engage organizations in charge of community toilets (to pay for and supply the product to the toilets)
• Train and incentivize caretakers to encourage them to use the product and keep the facilities clean
• Organize community engagement actions and awareness-raising campaigns to educate people

BEHAVIOR CHANGE IS A PROCESS THAT TAKES TIME AND REQUIRES HIGH-LEVELS OF COMMUNITY ENGAGEMENT.

MISCONCEPTION:

Caretakers of community toilets are insignificant players in the sanitation value chain and cannot contribute to change sanitation behaviors.

KEY INSIGHT:

#7

CARETAKERS COULD BE CRITICAL CHANGE-MAKERS IN THEIR COMMUNITY, AND SHOULD BE MOTIVATED, EMPOWERED AND INCENTIVIZED ACCORDINGLY.
Community toilet caretakers are often precarious individuals. Given the nature of the job and the difficult working conditions, most caretakers come from precarious socio-economic backgrounds. Consequently, they are often poorly considered by end-users, nor properly supported or incentivized by community toilet managing organizations (municipalities or private companies). This often results in unmotivated and uncommitted caretakers.

**CHINA**

Li Yan
76 years old, Sichuan, lives with his wife, daughter and son-in-law

*Professional experience:* Mr. Li Yan used to be a cleaner in restaurants in Shanghai. He came back to his village in Sichuan when he retired.

*Drivers to become a caretaker:* Li Yan receives a small retirement pension and needs another source of income. He already had experience in cleaning and was comfortable with this new activity.

*Other activities:* Li Yan does not have any other activity but his daughter and son-in-law are working. He also receives money from his retirement pension.

*Monthly income of the family:* Li Yan earns about USD 30 per month as a caretaker (monthly budget of the family is around USD 350).

**INDIA**

Parvati
42 years old, Pune, widow with 2 children

*Professional experience:* Parvati did not go to school and before her husband died, she never worked: she had always been a housewife.

*Drivers to become a caretaker:* Parvati decided to become a caretaker when her husband died, to benefit from the free housing offered by the municipality of Pune.

*Other activities:* Parvati earns USD 25 per month.

**SOUTH AFRICA**

Parvati
27 years old, Johannesburg, lives with her husband and two children

*Professional experience:* Sibongile studied up to the 12th grade but she never found a full-time and stable job.

*Drivers to become a caretaker:* Sibongile was hired by a private company in charge of cleaning and maintaining community toilets, she only does this job for the money.

*Other activities:* Sibongile does not have any other activity to help her family.

*Monthly income of the family:* Sibongile earns around USD 100 per month as a caretaker. With her husband, they have around USD 250 at the end of the month to feed their family.

Because of this situation, they are often poorly considered by end-users of community toilets.

He is a nice person, but he is too old. He is not able to maintain the facility properly, it's often very smelly and dirty.

If I had the choice, I would prefer to use another toilet because the condition of this one is terrible.

Nobody in the neighborhood likes this lady. She is just doing this job for the free housing, we never see her actually cleaning the facility.

My neighbors and I decided to stop paying her as long as she is not cleaning efficiently the toilet.

The caretaker is not from the community, we do not know her and we do not trust her.

Sometimes she is not doing the job properly, she does not care as she is not using the toilets herself.

Caretakers are critical in the sanitation value chain. They are in charge of maintaining clean facilities and are in direct and daily contact with end-users. As such, they should be properly motivated and empowered to contribute to change habits.

**CURRENT SITUATION**

Today, most community toilets are not clean nor well-maintained due to a lack of commitment from caretakers. Most do not have a choice (lack of water to clean properly, insufficient equipment or products provided, no maintenance service in case of a blocked pipe, etc.), and some also suffer from a lack of motivation and professionalism, due to a very low level of recognition from managing organizations and end-users (low salary, disrespect from the community, etc.). Consequently, many do not clean very often (sometimes less than once a week).

**OUR CONVICTION**

If properly motivated and incentivized, caretakers can take initiative and become increasingly committed. Community toilet conditions will directly benefit from this commitment, with a higher level of cleanliness and better smell, offering a better experience to end-users.

**PUNE PILOT TEST:** Caretakers from our 8 test community toilets were financially incentivized, and more importantly, received support and recognition. They were all perceived as “the ones engaged in a project with an international company”, which contributed to empower them and give them more social status.

**NAIROBI:** Most community toilets are managed by Youth Group members who live in the community. They are involved in various economic activities which are beneficial for the area, such as garbage collection, water delivery, community toilet management, cleaning of shared toilets, etc. As they are deeply rooted in the community, users tend to respect them more than in other countries (they try not to misuse the facility and most of the time, they pay the fee).

Models that engage caretakers from local communities prove much more effective, as they improve the sense of ownership and accountability among inhabitants. In this situation, caretakers could also play a key role in raising awareness and promoting improved sanitation behaviors in their community.

**JOHANNESBURG:** Recently, some private organizations have recruited local caretakers with the help of community leaders. This approach has increased community ownership and accountability.

**NAIROBI:** Youth Groups in charge of managing community toilets have not been trained on health and sanitation (by NGOs, the municipality or private companies). They are committed to tackle the open defecation issue and they have a direct interest in doing so as they are paid by users of their facility.

**MUMBAI:** The municipality has implemented an innovative model that consists of employing community members to clean and manage the facility (partnerships with NGOs and Community-Based Organizations). It leverages social connections to increase ownership and accountability of both the end-user and caretaker.

**OUR CONVICTION**

These two examples show that better incentivization and motivation of caretakers can generate a virtuous circle: they are more motivated, hence more likely to clean, hence more respected by the community, hence more recognized and motivated.

Caretakers could be critical change-makers in their community, and should be motivated, empowered and incentivized accordingly.

**SOURCES OF INSPIRATION**

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Caretakers could be critical change-makers in their community, and should be motivated, empowered and incentivized accordingly.
Sanitation is a key concern for those living in low-income settlements, especially women. A significant number of people do not or cannot use existing public or private facilities. Unsafe sanitation practices are therefore significant even when toilets are accessible.

Keep investing in sanitation to develop innovative and ambitious solutions as it is a key concern for hundreds of millions of people worldwide, with major global development goals at stake.

Involving people from communities as much as possible in the process as they are (1) interested in the topic, and (2) the best resources to understand the context and identify real game-changing solutions.

Shift mindset from access to toilets to access to clean toilets. Continue to invest in infrastructure by (1) properly maintaining and improving existing solutions (e.g. community toilets), (2) supporting the construction of private toilets, when it is adapted to the context and (3) developing new infrastructure, more adapted to low-income settlement realities, such as waterless or container-based options.

Put more focus on the user experience to make sure existing facilities are actually used. While policymakers have focused mostly on the development of infrastructure and technology, it should shift and take into account the emotional and behavioral component of the sanitation topic. Customer centricity is a key condition of success.

In this section, Archipel&Co and Firmenich recommend actions for each of the 7 insights collected on the field. These recommendations and the associated actionable toolkit are proposed to all practitioners wanting to improve the sanitation situation.

<table>
<thead>
<tr>
<th>INSIGHT</th>
<th>ACTIONS</th>
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<tr>
<td>#3 In-house toilets are not applicable in many house given their layout and small size. Alternate options, such as community toilets or shared toilets are often more adapted to slum habitat realities.</td>
<td>Do not deprioritize community toilets too soon as they are often more adapted to slum realities, particularly when space constraints are high. Authorities should continue to invest in such models to improve user experience and limit unsafe sanitation behaviors: (1) increase the number of seats available, (2) provide proper access to water and sewage networks and (3) improve cleanliness and odor conditions. Continue to explore alternative models, such as shared toilets. Such options (facility shared amongst a few households only, who are responsible for its cleaning and maintenance) encourage ownership and responsibility and are often appreciated by low-income households. Shared toilets combine the advantages of both community toilets and in-house toilets, and when available, can successfully encourage people to abandon unsafe sanitation practices.</td>
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## ACTIONS

### #4 Price is not the main obstacle to the adoption of safe sanitation practices. But pricing strategies are essential to ensuring access to sanitation, sustainability and a sense of ownership.

Explore successful paying schemes for community toilets. To be effective, the paying scheme should be:
- Affordable for end-users (preferably with a monthly pass system);
- Incentivizing for caretakers (in order to encourage them to effectively clean the toilet and increase the number of people using it);
- Easy to manage and control (successful models have been observed on the field: in Mumbai for instance, some caretakers keep a rigorous logbook with the list of households who had paid their monthly pass and continuously check people entering the facility).

### #5 Improving user experience - odor and cleanliness - is considered a major driver for change if the most challenging availability problems (closing and waiting time) have been solved.

Promote the development and use of cleaning products that include malodor counteractant technology, either through a BtoC or a BtoB strategy.

See next page for more details.

### #6 Improving user experience has a significant impact on frequency of toilet usage and willingness to pay when awareness-raising programs are organized concurrently.

Spend time engaging local communities to foster and entrench behavior change over the long term. Old habits die hard and behavior change never happens in one day – especially when it comes to sanitation, which is a deeply personal and cultural topic. In order to progressively encourage people to change their practices, large and diverse community engagement campaigns should be launched in targeted communities (activities with children, support to key influencers, educational campaigns, gaming strategies, etc.). In any case, they require to build trust and long-lasting relationships with local communities, which is a time- and resource-consuming effort. Consequently, organization and funding of such activities should be considered early in the process by the organizations in charge.

### #7 Caretakers could be critical changemakers in their community and should be motivated, empowered and incentivized accordingly.

Properly incentivize caretakers, as they are key players of the sanitation value chain. Experience shows that when they are properly motivated and recognized, they are much more effective in maintaining clean facilities, and can even contribute to raising awareness among their communities. Beyond financial incentives, social recognition and other social incentives should be considered to strengthen their self-esteem and image in the community and to empower them over the longer term (e.g. health insurance, training support for their children’s education, etc.). Funding of such incentive models should be taken into account in the business model of community toilets.

## ZOOM #5

Promote the development and use of cleaning products that include malodor counteractant technology, either through a BtoC or a BtoB strategy.

<table>
<thead>
<tr>
<th>WHAT</th>
<th>Format &amp; fragrance preferences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format:</td>
<td>Air freshener pad or spray due to its ease of use and relative safety around children. In South Africa, liquid or powder formats are preferred.</td>
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<tr>
<td>Scent:</td>
<td>Floral and fruity scents are appreciated. Chemical smells associated with bleach or disinfectant (mostly used to clean) are also appreciated as they are strongly associated with cleanliness. In all cases, low dosages should be provided as toilet spaces are small.</td>
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<table>
<thead>
<tr>
<th>WHERE</th>
<th>Countries with business potential</th>
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</thead>
<tbody>
<tr>
<td>India, Kenya, South Africa</td>
<td>Business opportunities in China appear to be low, as the cleaning culture (hence willingness to pay) is much lower.</td>
</tr>
<tr>
<td>China, India, Kenya, South Africa</td>
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<th>WHO</th>
<th>Targets for the product</th>
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<tr>
<td>Females as they are generally the ones responsible for cleaning houses and toilets (including shared toilets, on a rotational basis with other households using them)</td>
<td>Managing organizations in charge of the maintenance and cleaning of community toilets. The strategy should be adapted to each city’s specificities, as the organizations in charge of buying the cleaning products can differ:</td>
</tr>
<tr>
<td></td>
<td>• Municipalities directly (e.g. Pune, China)</td>
</tr>
<tr>
<td></td>
<td>• Private sanitation companies outsourced by government (e.g. South Africa)</td>
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<tr>
<td></td>
<td>• Community organizations (e.g. neighbor committees in China, NGOs in Mumbai, community-based organizations in Nairobi)</td>
</tr>
<tr>
<td></td>
<td>• Sanipreneurs (e.g. Sanergy in Nairobi)</td>
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<th>HOW MUCH</th>
<th>Willingness to pay for the product</th>
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<tr>
<td>Users’ declared willingness to pay for an air freshener pad that would last 2 weeks:</td>
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<tr>
<td></td>
<td>• India: between USD 0.30 and 0.57</td>
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<tr>
<td></td>
<td>• Kenya: between USD 0.82 and 1.16</td>
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<tr>
<td></td>
<td>• South Africa: up to USD 1.83</td>
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</table>

Managing organizations’ willingness to pay for such products should be assessed on a case-by-case basis. The product should eventually be integrated in the supply process of each organization, hence be competitive in terms of price. As an indication, products currently used in Pune community toilets cost between INR 150 and 600 (USD 2-8) for 5L of product (prices vary according to brands and types of products). Caretakers generally use 10L of product per month.